

NEW SPECIES AND NEW RECORDS OF *TESSERODON* HOPE (COLEOPTERA: SCARABAEIDAE) FROM NORTHERN AUSTRALIA

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Five new species of *Tesserodon* Hope (Scarabaeini: Canthonina) are described: *erratum*, *feehani*, *henryi*, *hilleri* and *simplicipunctatum*. Identity of *T. gestroi* Lansberge is discussed and the species redescribed. New records and taxonomic notes are given for *T. gestroi*, *T. intricatum* Lea, *T. granulatum* Matthews, *T. novaehollandiae* (Fabricius), *T. variolosum* Macleay, *T. pilicrepus* Matthews and *T. tenebroides* Matthews. A key to the Australian species is provided and species relationships briefly discussed.

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Matthews (1974) revised Australian genera and species of Scarabaeini, including *Tesserodon* Hope in which he recognized eight valid species. *Tesserodon* also occurs in New Guinea where five species were attributed to the genus by Paulian (1985). This paper describes five additional Australian species, four on the basis of new material not seen by Matthews and one following examination of the holotype of *T. gestroi* Lansberge. The Australian species are keyed, new records and notes on intraspecific variation are given for most of the previously described species, and species relationships within the genus are briefly discussed.

ABBREVIATIONS

The following abbreviations for collections are used:

ANIC—Australian National Insect Collection, CSIRO, Canberra, A.C.T.

ANIC (MMUS)—Australian National Insect Collection, CSIRO (on permanent loan from the Macleay Museum, University of Sydney), Canberra, A.C.T.

BMNH—British Museum (Natural History), London, U.K.

HAHC—H.F. Howden Collection, Ottawa, Canada

MCSN—Museo Civico de Storia Naturale "Giacomo Doria", Genoa, Italy

OXUM—Hope Entomological Collections, Oxford, U.K.

PGAC—P.G. Allsopp Collection, Bundaberg, Qld

QMBA—Queensland Museum, Brisbane, Qld

QPIM—Entomology Branch, Department of Primary Industries, Mareeba, Qld

SAMA—South Australian Museum, Adelaide, S.A.

UQBA—Department of Entomology, University of Queensland, Brisbane, Qld

WAMP—Western Australian Museum, Perth, W.A.

In locality records CYP stands for Cape York Peninsula.

Tesserodon Hope, 1837

Tesserodon Hope, 1837, p.55.

TYPE SPECIES

Scarabaeus novaehollandiae Fabricius, 1775, by monotypy.

KEY TO THE AUSTRALIAN SPECIES OF *TESSERODON*

(Modified from Matthews (1974))

1 Punctures on elytral intervals accompanied by chevron or horseshoeshaped cicatrices or complete annuli2

Elytral punctures simple5

2(1) Eyes smaller, separated by 11–13 eye widths. Clypeal edge strongly notched at clypeogenal suture. Elytral intervals 2–6 subcostate. Hindwing reduced, flightless species. Total length 5.8–8.3 mm.*feehani* sp. nov.

Eyes larger, separated by 5–8 eye widths. Clypeal edge at most feebly notched at clypeogenal suture. Elytral intervals flatter, only interval 6 sometimes subcostate. Fully winged species3

3(2) Elytral intervals dull, with dense microsculp-

- ture. Aedeagus as in Fig.2. Total length 5.3–7.0 mm. *variolosum* Macleay
- Elytral intervals shiny, at least in centre portion 4
- 4(3) Cicatrices around elytral punctures small, leaving about half of width of interval smooth, never closed into annuli; intervals often tectate, at least laterally. Eyes larger, separated by 5–6 eye widths. Aedeagus as in Fig.1. Total length 5.6–8.9 mm *erratum* sp.nov.
- Cicatrices around elytral punctures large, leaving about 1/3 width of interval smooth, closed into annuli or almost so; intervals nearly flat, only the 6th more or less tectate. Eyes smaller, separated by 6–8 eye widths. Aedeagus as in Fig.3. Total length 5.1–7.2mm. *intricatum* Lea (part)
- 5(1) Dorsal part of eyes small, not reaching halfway to clypeogenal suture, separated by about 20 eye widths. Male with small projection on hind trochanter, hind femur without a projection at base of posterior edge 6
- Dorsal part of eyes larger, reaching halfway or more to clypeogenal suture, separated by 5–16 eye widths. Male without small projection on hind trochanter, usually with a projection at base of posterior edge of hind femur 7
- 6(5) Edge of head nearly entire at clypeogenal sutures. Elytral epipleura transversely corrugated posteriorly. Total length 4.2–6.3mm. *tenebroides* Matthews
- Edge of head distinctly notched before clypeogenal sutures. Elytral epipleura not corrugated. Total length 4.8–5.4 mm. *pilicrepus* Matthews
- 7(5) Shape suboval, elytra shortened. Hindwing reduced, flightless species. Eyes narrower, separated by 13–16 eye widths 8
- Shape more elongate, elytra not shortened. Fully winged species. Eyes wider, separated by 5–12 eye widths 9
- 8(7) Larger species, total length 7.1–8.6 mm. Punctuation on head and pronotum denser, tending to be arranged in transverse rows. *henryi* sp. nov.
- Smaller species, total length 4.2–5.0 mm. Punctuation of head and pronotum less dense, not arranged in transverse rows. *hilleri* sp. nov.
- 9(7) Clypeus with large granule behind base of each seta. Setae slender and strongly recurved. Total length 4.9–8.2mm. *granulatum* Matthews
- Clypeus without granules. Setae stout, erect 10
- 10(9) Genal edges sharply angled, straight before and behind the angle. Total length 7.0–8.0mm. *angulatum* Westwood
- Genal edges with a rounded angle, not prominent, usually feebly curved. 11
- 11(10) Elytral intervals flat, dull with dense microsculpture. Total length 5.1–7.5mm. *gestroi* Lansberge
- Elytral intervals subconvex, nitid at least in centre 12
- 12(11) Dorsal parts of eyes narrow, separated by 6–8 eye widths. Discal pronotal punctures linear. Total length 5.2–7.1mm. *intricatum* Lea(part)
- Dorsal parts of eyes wider, separated by 5–6 eye widths. Discal pronotal punctures simple or elongate-annular 13
- 13(12) Larger species, total length 7.3–7.9mm. Space between clypeal teeth V-shaped. Pronotal punctures in centre of disc simple, without annular rings. *simplicipunctatum* sp. nov.
- Smaller species, total length 3.8–6.1 mm. Space between clypeal teeth usually U-shaped. All pronotal punctures with annular rings. *novae-hollandiae* (Fabricius)
- Tesserodon feehani** sp. nov.
(Figs 7,9,10)
- ETYMOLOGY
For the collector John Feehan, CSIRO, Canberra.
- MATERIAL EXAMINED
Holotype ANIC 105 ♂ 15.16°S 144°59'E, 14 km W by N of Hopevale Mission, NE Qld, 7–10.v.1981, J. Feehan. Paratypes (14): QLD: same data as holotype, (9♂♂, 2♀♀). 15.24°S 145.03°E, Hazelmere Stn, 24

km WNW of Cooktown, 8.v.1981, J. Feehan, (3 ♀ ♀). (Paratypes in ANIC, QMBA, QPIM).

DESCRIPTION

Oval, convex. Total length 5.8–8.3 mm., maximum width 4.1–5.3 mm.

Male. Head. Median teeth small, apices rounded, broadly V-shaped between, a little expanded past shallow lateral excisions, rest of margins straight to clypeogenal sutures which are strongly notched, genal angles obtusely rounded. Dorsal parts of eyes small, oval, extending about halfway to clypeogenal sutures, separated by 11–13 eye widths. Punctures numerous, coarse, deep, reniform, each with a short, erect seta.

Pronotum. Punctures coarse, deep, dense, guttiform, tending to form longitudinal lines. Each puncture with a fine, erect seta at basal point, surface nitid between.

Elytra. Broad, widest about 1/3 of distance from base, then evenly rounded to apex. Striae geminate, crenulate. Intervals 2–6 subcostate on basal 2/3, nitid in centre, fine microsculpture along margins, rows of punctures along lateral margins, each puncture with an annular cicatrice and a short, erect seta in centre.

Hind wings. Greatly reduced to about 1/2 length of elytra.

Legs. Protibial spur short, truncate, broader at apex than at base. Hind femur with a strong, rounded tubercle at base of posterior edge. Tooth at apex of hind tibia strong, recurved.

Ventral surface. Meso- and metasterna with numerous, deep punctures, annulate to horse-shoe-shaped on lateral lobes of metasternum, each with a short, erect seta. Punctures on pygidium with complete annuli and short, erect setae, surface nitid between.

Aedeagus. Parameres asymmetrical (Fig. 7).

Female. Clypeal teeth and lateral excisions stronger. Protibial spur narrow, pointed, hind femur without basal tubercle and hind tibia without apical tooth. Otherwise like male.

COMMENTS

This flightless species is close to *henryi* sp. nov. but the hind wings are not as reduced and the elytra are different. The ocellate punctures on the elytral intervals are similar to those of *erratum* sp. nov. but the almost costate condition of the intervals in *feehani* separates them. *T. feehani* has been taken in cow dung and trapped with human excrement during both day and night. Most specimens were taken in closed forest.

Tesserodon variolosum Macleay, 1888 (Fig. 2)

Tesserodon variolosum Macleay, 1888, p.897; Matthews, 1974, p. 88.

MATERIAL EXAMINED

Holotype ♀, King's Sound, W.A., ANIC (MMUS). Other material: NT: Larrimah, 4.xii.1978, R.I. Storey, (2 ♀ ♀); Berry Springs Rd, via Darwin, 27-30.xi.1978, R.I. Storey, (1 ♂, 1 ♀); Wildman R, Arnhem Hwy, 30.xi.1978, R.I. Storey, (6 ♂ ♂, 4 ♀ ♀); 12.06°S 133.04°E, Cooper Ck, 19 km E by S of Mt Borradaile, 31.v.1973, E.G. Matthews, (1 ♀). WA: 18.10°S 125.35°E, Fitzroy Crossing, 17.iii.1984, K. and E. Carnaby, (1 ♂). (Specimens in ANIC, HAHC, PGAC, QMBA, QPIM, SAMA, UQBA).

COMMENTS

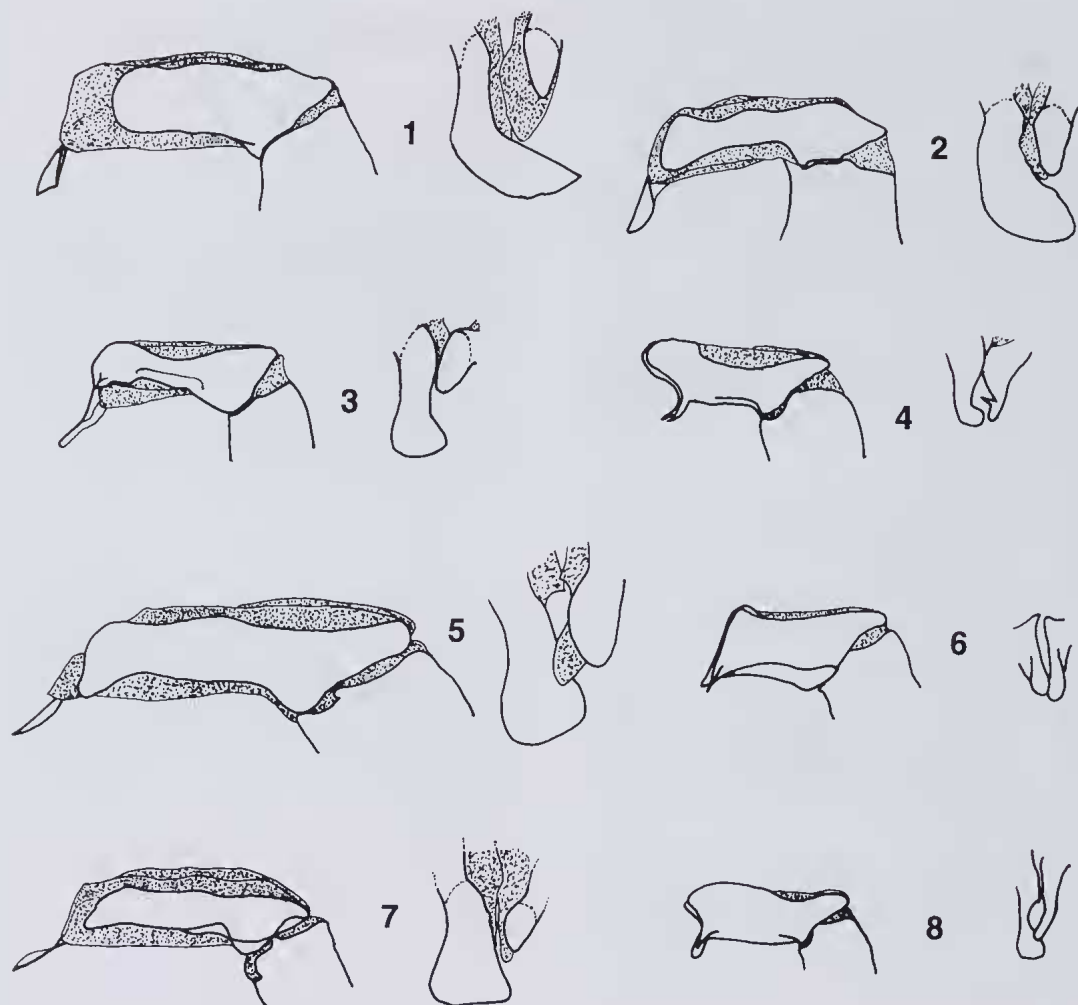
T. variolosum has a wide distribution from Groote Eylandt in the Gulf of Carpentaria to the east Kimberleys in Western Australia. It is close to *erratum* sp. nov.; both species were taken at the Wildman River. *T. variolosum* is usually smaller than *erratum* with the elytral intervals duller and flatter, especially apically. Both species have the elytral interval punctures at least partially cicatricate (a character not noted by Matthews (1974) for *variolosum*). Eyes are smaller in *variolosum*, separated by 7–10 eye widths. The Fitzroy Crossing specimen has the pronotal punctures sparser, annular and not formed into grooves. However, positive identification depends on examination of the male genitalia (Fig. 2). Specimens were taken at light and trapped with human excrement baits.

Tesserodon erratum sp. nov. (Figs 1,13,14)

Tesserodon gestroi Lansberge: Matthews, 1974, p.82.

MATERIAL EXAMINED

Holotype QMBA T.11590 ♂ Wildman R, Arnhem Hwy, N.T., 30.xi.1978, R.I. Storey. Paratypes (42) NT: same data as holotype, (3 ♂ ♂, 8 ♀ ♀); 6 km E of Humpty Doo, 9.ii-4.iii.1987, R.I. Storey, (4 ♂ ♂, 19 ♀ ♀); Humpty Doo, 28-29.xi.1974, R.I. Storey, (1 ♀); 24-43 km S of Darwin, 29.i.1968, E. Matthews, (2 ♂ ♂ 3 ♀ ♀); 24 km S of Darwin, 21.i.1968, E.M., (1 ♂); Lee Point, Darwin, 28.i.1968, E. Matthews, (2 ♀). Paratypes in ANIC, HAHC, PGAC, QMBA, QPIM, SAMA, UQBA.



FIGS 1–8. *Tesserodon* spp., parameres, lateral and apical views: 1, *T. erratum* sp. nov. 2, *T. variolosum* Macleay. 3, *T. intricatum* Lea. 4, *T. gestroi* Lansberge. 5, *T. henryi* sp. nov. 6, *T. granulatatum* Matthews. 7, *T. feehani* sp. nov. 8, *T. hilleri* sp. nov.

DESCRIPTION

Suboval, somewhat flattened. Total length 5.6–8.9 mm., maximum width 3.7–5.9 mm.

Male. Head. Median teeth small, apices rounded, rounded V-shaped between, only feebly excised outside median teeth, rest of margins feebly curved to the slightly notched clypeogenal sutures, genal angles rounded. Dorsal parts of eyes large, extending about $\frac{2}{3}$ of way to clypeogenal sutures, separated by 5–6 eye widths. Surface densely and coarsely punctate with large reniform punctures accompanied by tubercular aspiration on clypeus, with short, erect setae.

Pronotum. Surface densely punctate with

large, deep punctures which are elongate and crepidulate or guttiform on disc, laterally tending to form longitudinal grooves, becoming compound then strongly horseshoe-shaped towards edges, with very short, stout setae, surface between nitid.

Elytra. Broad, widest about $\frac{1}{3}$ of way from base, then roundly tapering to apex. Striae punctate, geminate, crenulate. Intervals slightly convex, becoming somewhat tectate laterally, surface nitid in centre, fine microsculpture laterally, with a row of punctures along each lateral margin, each preceded by a horseshoe-shaped cicatrix and bearing a short, erect seta.

Hind wings. Fully developed.

Legs. Protibial spur short, widened at apex which is about 1 1/2 times width at base. Hind femur with a round tubercle at base of posterior edge. Tooth at apex of hind tibia short, blunt.

Ventral surface. Mesosternum deeply punctate with large reniform or annular punctures, metasternum similarly punctate, weakly so on median lobe becoming stronger, larger and more cicatricose on lateral lobes, all punctures with short setae. Pygidium with large reniform or horseshoe-shaped punctures.

Aedeagus. Parameres asymmetrical (Fig. 1).

Female. Protibial spur narrow, pointed, hind femur without basal tubercle and hind tibia without apical tooth. Otherwise like male.

COMMENTS

Matthews (1974) misidentified this species as *T. gestroi* Lansberge for the reasons mentioned under that species. The above description is basically that given by Matthews (1974) for *gestroi*. It is still known only from the Darwin area, as far east as the Wildman River crossing on the Arnhem Highway. Specimens were trapped with human excrement baits.

Tesserodon intricatum Lea, 1923 (Fig. 3)

Tesserodon intricatum Lea, 1923, p.357; Matthews, 1974, p. 83.

MATERIAL EXAMINED

Holotype ♂ Groote Eylandt, N.T., N.B. Tindale, SAMA. Other material: NT: 32 km W of Katherine, 8.ii.1968, E. Matthews, (1♂); Elcho Is, 26.iii.1976, M.E. Farr, (1♂); same locality, 29.iv.1976, K. and E. Carnaby, (1♂); 6km E of Humpty Doo, 9.ii-4.iii.1987, R.I. Storey, (1♀); 9 km W of Jabiru, 29-30.xi.1978, R.I. Storey, (2♀); 12.06°S 133.04°E, Cooper Ck, 19 km E by S of Mt Borradaile, 31.v.1973, E.G. Matthews, (1♂); same locality, 5.vi.1973, M.S. Upton, (1♀); 12.20°S 133.19°E, Nabarlek Dam, 15 km S by W of Nimbuwah Rock, 2.vi.1973, E.G. Matthews, (2♀); 12.23°S 132.56°E, 7 km NW by N of Cahills Crossing, East Alligator R, 27.v.1973, E.G. Matthews, (2♂); 12.46°S 132.39°E, 12 km NNW of Mt Cahill, 20.v.1973, E.G. Matthews, (2♂, 1♀); 12.48°S 132.42°E, Nourlangie Ck, 8 km N of Mt Cahill, 21.v.1973, E.G. Matthews, (2♂, 2♀); 12.49°S 132.51°E, 15 km E by N of Mt Cahill, 29.x.1972, E. Britton, (2♂, 3♀); 12.47°S 132.51°E, Baroalba Ck Springs, 19 km NE by E of Mt Cahill, 28.x.1972, E. Britton, (2♀); 12.50°S 132.51°E, 15 km E by N of Mt Cahill, 29.x.1972, E.

Britton, (4♂, 1♀); 12.52°S 132.47°E, Nourlangie Ck, 8 km E of Mt Cahill, 22.v.1973, E.G. Matthews, (1♂). WA: Kununurra, 9-13.xii.1975, R.I. Storey, (4♂). (Specimens in ANIC, QPIM, SAMA).

COMMENTS

The above specimens exhibit considerable variation and it is with some hesitation that I include them all under *intricatum*. Future study may indicate that more than one species is represented. Nine specimens are close if not identical to the holotype, including the possession of annular rings around the punctures on the elytral intervals. Another 15 are identical to these in all characters (including aedeagus (Fig.3)) except that the elytral punctures are not at all annular. Others also lack the annular rings but vary in structure of the edge of the clypeus (teeth more or less developed), density and shape of the pronotal punctures and even shape of the tubercle on the male hind femur which is very strong in some and almost absent in the remainder. All forms were taken in the Mt Cahill area. Specimens were collected at light and trapped with human excrement.

Tesserodon tenebroides Matthews, 1974

Tesserodon tenebroides Matthews, 1974, p.84.

MATERIAL EXAMINED

Holotype ♂, Barrow Is, W.A., 26.v.1964, W.H. Butler, WAMP. Other material: WA: Blow Holes Rd, 30-50 km N of Carnarvon, 20-21.vii.1978, H. and A. Howden, (6♂, 6♀); same locality, 3.ix.1978, K. and E. Carnaby, (1♂, 4♀); W side of Northwest Cape, N of Cape Range Park, 27-28.vii.1978, H. and A. Howden, (1♂); 26 km S of Exmouth, 26.vii.1978, H. and A. Howden, (2♂). Specimens in ANIC, HAHC, QPIM, UQBA.

Tesserodon pilicrepus Matthews, 1974

Tesserodon pilicrepus Matthews, 1974, p.84.

MATERIAL EXAMINED

Holotype ♂, Peron Peninsula near Nanga (Taillefer Isthmus), W.A., 4.viii.1972, E.G. Matthews and H.F. Howden, SAMA. Other material: WA: Burma Road Reserve, 30 km E of Walkaway, 16.ix.1986, R.P. McMillan, (1♀); 52 km E of Kalbarri, 7-8.viii.1978, H. and A. Howden, (1♂). Specimens in HAHC, WAMP.

***Tesserodon henryi* sp. nov.**
(Figs 5,11,12)

ETYMOLOGY

For its first collector Prof. Henry F. Howden of Ottawa, Canada.

MATERIAL EXAMINED

Holotype QMBA T.11588, ♂, Hann Tableland, 13 km WNW of Mareeba, NE Qld, 17.i-17.ii.1989, Storey and Dickinson, MDPI Intercept Trap Site No. 31. Paratypes (33): QLD: same data as holotype, (2♂♂, 7♀♀); same data, 13.x-9.xii.1988, (1♀); same data, 7.xii.1988-17.i.1989, (1♂, 2♀♀); same data, 17.ii-20.iii.1989, (1♀); 12 km W of Herberton, 11-15.ii.1979, R.I. Storey, (1♂, 4♀♀); Watsonville, 22-27.iii.1980, R.I. Storey, (8♂♂, 3♀♀); 27-32 km W of Atherton, 10.ii.1975, H. and A. Howden, (2♂♂, 2♀♀). Paratypes in ANIC, HAHC, PGAC, QMBA, QPIM, SAMA, UQBA.

DESCRIPTION

Oval, convex. Total length 7.1-8.6 mm., maximum width 4.9-6.0 mm.

MALE. Head. Median teeth small, apices rounded, broadly V-shaped between, lateral excisions feeble, rest of margins slightly rounded to clypeogenal sutures which are feebly notched, genal angles obtusely rounded. Dorsal parts of eyes small, suboval, extending almost halfway to clypeogenal sutures, separated by 14-16 eye widths. Punctures dense, coarse, reniform, somewhat transversely aligned, each with a short, erect, pointed seta.

Pronotum. Punctures coarse, dense, guttiform, tending to form longitudinal lines, each puncture with a short, erect, pointed seta at basal point, surface nitid between, a row of horseshoe-shaped punctures along basal margin.

Elytra. Broad, shortened, widest just before base, evenly rounded to apex. Striae geminate, slightly crenulate. Intervals flat to feebly convex, surface dull with dense microsculpture, rows of punctures along lateral margins of each with short, erect, blunt setae which are angled towards centre of each interval.

Hind wings. Greatly reduced to about 1/3 length of elytra.

Legs. Protibial spur short, truncate, broader at apex than at base. Hind femur with a feeble,

rounded tubercle at base of posterior edge. Tooth at apex of hind tibia strong, recurved.

Ventral surface. Meso- and metasterna with numerous punctures, annulate to horseshoe-shaped, each with a short, erect seta. Pygidium with large annulate punctures with short, erect setae, surface between nitid.

Aedeagus. Parameres asymmetrical (Fig. 5).

FEMALE. Protibial spur narrow, pointed, hind femur without basal tubercle and hind tibia without apical tooth. Otherwise like male.

COMMENTS

Although it has the reduced eyes and shortened elytra of the similarly flightless *tenebroides* and *pilicrepus*, *henryi* does not seem to be closely related to them. It lacks the projection on the hind trochanter, and has the small tubercle on the posterior edge of the hind femur found in most species of the genus. *T. henryi* has been taken in only two areas adjacent to the western edge of the Atherton Tableland. The habitat is tall eucalypt forest on coarse granite soil where it was trapped with human excrement baits and taken in intercept/pitfall traps.

***Tesserodon hilleri* sp. nov.**
(Figs 8,15,16)

ETYMOLOGY

For Tony Hiller of Mt Glorious, the collector of most of the known specimens.

MATERIAL EXAMINED

Holotype QMBA T.11589, ♂, 90 km SE of Charters Towers, NE Qld, 19.iii.1984, A. Hiller, found feeding inside body of dead *Haploscapanes barbarossa* (Fabricius) [Coleoptera:Scarabaeidae]. Paratypes (5): QLD: same data as holotype, collected inside dead *Macropanesthia rhinoceros* Saussure [Blattodea:Blaberidae], (2♂♂, 2♀♀); 100 km E of Hughenden, 26-30.iii.1976, R.I. Storey, (1♂). Paratypes in ANIC, QMBA, QPIM.

DESCRIPTION

Oval, moderately convex. Total length 4.2-5.0 mm., maximum width 2.9-3.0 mm.

Male. Head. Median teeth small, apices rounded, broadly U-shaped between, a little expanded past V-shaped lateral excisions, rest of margin almost straight to clypeogenal sutures



9



10



11



12



13



14

which are feebly notched, genal angles obtusely rounded. Dorsal parts of eyes small, extending about halfway to clypeogenal sutures, separated by 13–15 eye widths. Punctures moderately dense, coarse, reniform, each with a short, erect seta, surface between subnitid with fine microsculpture.

Pronotum. Punctures moderate, coarse, those on anterior 2/3 elongate, linear, the posterior 1/3 and along lateral margins circular except those along basal margin which are horseshoe-shaped, each puncture with a short, erect seta at posterior end, surface between subnitid with very fine microsculpture.

Elytra. Broad, shortened, widest about 1/3 distance from base, then evenly rounded to apex. Striae geminate, crenulate. Intervals flat to feebly convex, surface with fine microsculpture, stronger towards sides, each interval with a row of widely spaced punctures along lateral margins, each puncture bearing a short, erect seta.

Hind wings. Greatly reduced to about 1/3 length of elytra.

Legs. Protibial spur truncate, inner apical angle produced. Hind femur with a feeble, rounded tubercle at base of posterior edge. Tooth at apex of hind tibia strong, recurved.

Ventral surface. Annulate punctures on mesosternum and lateral lobes of metasternum, central portion of metasternum with simple punctures, all bearing short, erect setae. Pygidium with a few coarse, setate punctures, surface nitid to finely microsculptured between.

Aedeagus. Parameres asymmetrical (Fig. 8).

Female. Median teeth and lateral excisions of clypeus stronger. Protibial spur narrow, pointed, hind femur without basal tubercle and hind tibia without apical tooth. Otherwise like male.

COMMENTS

T. hilleri is another flightless species from Queensland which like *feehani* and *henryi*. but unlike the Western Australian *pilicrepus* and *tenebroides* has the hind wings reduced to a vestige rather than completely absent. It is closely related to *novaehollandiae* (Fabricius), their aedeagi being almost indistinguishable. Specimens have been collected from the bodies of large decaying insects and also trapped with human excrement.

Tesserodon granulatum Matthews, 1974
(Fig. 6)

Tesserodon granulatum Matthews, 1974, p.85.

MATERIAL EXAMINED

Holotype ANIC ♂, Ayers Rock, N.T., 16.ii.1967, M.S. Upton. Other material: WA: 21.20°S 127.00°E, 160km SW of Balgo, iii.1975, S. Fritsch, (1♂, 1♀); 2–6 km SE of Broome, 14–18.xii.1975, R.I. Storey, (1♂, 4♀); 18.49°S 123.17°E, 163 km SE of Broome, 3.viii.1976, I.F.B. Common, (1♀); Talawara Stn, i.1971, A. Douglas, (3♂♂, 4♀♀); 21.21°S 125.59°E, Well 43, Canning Stock Route, 14.xii.1972, N.S.E. Iv, (1♂); 28.21°S 124.54°E, 90 km W of Neale Junction, 20.ix.1982, B. Hanich and T.F. Houston, (1♂); 28.21°S 122.37°E, 37 km NE of Laverton, 10–12.ix.1982, B. Hanich and T.F. Houston, (1♀); 21.44°S 123.40°E, Lake Auld, 11–17.vi.1986, L. Charlton, (1♀). Specimens in ANIC, PGAC, QPIM, UQBA, WAMP.

COMMENTS

The male was unknown to Matthews (1974), but is now known to have typical secondary sexual characters of truncate protibial spur and recurved inner apical tooth on the hind tibia. Both the hind trochanter and the posterior margin of the hind femur lack a projection. The aedeagus is illustrated in Fig.6. Specimens were taken at light and trapped with decaying fish and human excrement.

Tesserodon angulatum Westwood, 1841

Tesserodon angulatum Westwood, 1841, p.66.

HOLOTYPE

♂, New Holland, Swan River?, OXUM448. (not seen)

MATERIAL EXAMINED

None.

Tesserodon gestroi Lansberge, 1885
(Figs 4,17,18)

Tesserodon gestroi Lansberge, 1885, p. 375.

MATERIAL EXAMINED

Holotype ♂ Somerset, Cape York, i.1875, L.M. d'Alberty, MCSN. Other material: QLD: 11.40°S 142.50°E, Captain Billy Ck, CYP, ABRs Areas 4,5, and 6, 9–13.vii.1975, G.B. Monteith, (19♂♂, 25♀♀); Dividing Range, 15 km W of Captain Billy Ck, CYP, 4–9.vii.1975, G.B. Monteith, (1♀); Lake Boronto (=Wincheura), Newcastle Bay, CYP, 21–26.ix.1974, G.B. Monteith, (6♂♂, 3♀♀); same data, 30.i.–4.ii.1975, (9♂♂, 3♀♀). Specimens in ANIC, QMBA, QPIM, SAMA, UQBA.

DESCRIPTION

Elongate-oval, subconvex. Total length 5.1–7.5 mm., maximum width 3.4–4.5 mm.

Male. Head. Median teeth short, wider at base than length, V-shaped between, lateral excisions very weak, then rest of margins straight to clypeogenal sutures which are feebly notched, genal angles subquadrate, rounded. Dorsal parts of eyes large, extending about 3/4 of distance to clypeogenal sutures, separated by about 5 eye widths; canthus very short. Punctures moderate, coarse, round to reniform each with a short, thick, blunt, erect seta, surface between subnitid with very fine microsculpture.

Pronotum. Punctures dense, coarse, fairly constant in size and round shape over entire surface, each with a short, thick, blunt, erect seta at posterior end, surface between subnitid with very fine microsculpture.

Elytra. Elongate, widest at about basal 1/3, sides subparallel for basal 1/2, then rounded to apex. Striae punctate, geminate, crenulate. Intervals flat, rows of close punctures along lateral margins of each, with short, blunt, erect setae, surface between dull with dense microsculpture.

Hind wings. Fully developed.

Legs. Protibial spur truncate, inner apical angle produced. Hind femur with a strong, rounded tubercle at base of posterior edge. Tooth at apex of hind tibia strong, recurved.

Ventral surface. Meso- and metasterna with moderate, annulate punctures over entire surfaces, tending towards horseshoe-shaped on lateral lobes of metasternum, each with a fine, recurved seta centrally. Pygidium with moderate, dense, annulate punctures, each with a short, fine, erect seta, surface between nitid.

Aedeagus. Parameres asymmetrical, as in Fig. 4.

Female. Median teeth of clypeus stronger. Protibial spur narrow, pointed, hind femur without basal tubercle and hind tibia without apical tooth. Otherwise like male.

COMMENTS

T. gestroi was based on a single specimen collected by L.M. d'Albertis. Matthews (1974) was not able to examine the holotype and as no further specimens potentially belonging to this species were available from or near the type locality, he attributed *gestroi* to a large species taken in the north of the Northern Territory. Subsequently, Dr G.B. Monteith, Queensland Museum took a long series of specimens near the type locality and identified them as *gestroi*. My examination of the holotype of *gestroi* con-

firmed Matthews' error and allowed redescription of *gestroi*. Matthews' Northern Territory species was described above as *T. erratum*. *T. gestroi* is close to *novaehollandiae* (Fabricius), and has a similar aedeagus.

Queensland Museum records indicate that *gestroi* occurs almost entirely in rainforest, with only a few trapped in *Callitris intratropica* R. T. Baker and H.G. Smith forest adjacent to rainforest. The soil is sandy and most were trapped with human excrement baits. Available records also indicate that it is nocturnal.

Tesserodon simplicipunctatum sp.nov.
(Figs 19,20)

ETYMOLOGY

Latin *simplex*, unmixed, simplicity and *punctum*, small hole; referring to pronotal punctures.

MATERIAL EXAMINED

Holotype: QMBA T.11591, ♀, 10 km E Heathlands Airstrip, CYP, NE Qld, 8.vii.1975, G.B. Monteith. Paratype (1): NT: 12.17°S 133.13°E, 18 km E by N of Oenpelli, 1.vi.1973, Matthews and Upton, (1♀). Paratype in ANIC.

DESCRIPTION

Elongate-oval, subconvex. Total length 7.3–7.9 mm., maximum width 4.5–5.1 mm.

Female. Head. Median teeth short, about as wide as long, V-shaped between, flanked by shallow lateral excisions, rest of margins then straight to clypeogenal sutures which are feebly notched, genal angles obtusely rounded. Dorsal parts of eyes large, suboval, extending about 2/3 of way to clypeogenal sutures, separated by 5–6 eye widths. Punctures moderate, simple, those on back of occiput with incomplete, indistinct cicatrices, each with a short, erect seta, surface nitid between.

Pronotum. Punctures moderate, simple, evenly distributed over entire surface, those towards sides with incomplete, indistinct cicatrices, each with a short, erect seta, surface nitid between.

Elytra. Broad, widest just before base, subparallel for about 3/4 of the elytral length then rounded to apex. Striae geminate, slightly crenulate. Intervals feebly convex, surface nitid, rows of simple punctures along lateral margins of each interval, each puncture with a short, erect, pointed seta, most angled in towards centre of interval.

Hind wings. Fully developed.



15



16



17



18



19



20

Legs. Protibial spur narrow, pointed, hind femur without basal tubercle and hind tibia without inner apical tooth.

Ventral surface. Mesosternum with dense, annulate punctures, metasternum with simple punctures on anterior portion, annulate on posterior tending towards horseshoe-shaped on lateral lobes, each with a short, thin seta. Pygidium with numerous simple punctures, each with a short seta, surface nitid between.

Male. Unknown

COMMENTS

This large species, known only from two females, is apparently close to *novaehollandiae*. The simple pronotal punctures, especially in the centre of the disc should separate *simplicipunctatum* from all other Australian species. The Queensland specimen was trapped with human excrement bait set in heath vegetation including *Asteromyrtus lysicephala* (F. Muell. and Bailey) Craven and *Grevillea pteridifolia* Knight on sandy soil (QMBA records).

Tesserodon novaehollandiae (Fabricius, 1775)

Scarabaeus novaehollandiae Fabricius, 1775, p.29, no. 113.

Tesserodon novaehollandiae: Hope, 1837, p.55; Matthews, 1974, p. 87.

HOLOTYPE

New Holland (probably Endeavour River, Qld, June-August 1770, J. Banks), BMNH (Banks).(not seen)

MATERIAL EXAMINED

QLD: 11.40°S 142.45°E, Dividing Range, 15 km W of Captain Billy Ck, CYP, ABRs sltes 1 and 3, 5–12.ii.1976, G.B. Monteith, (3♂♂ 3♀♀); same locality, 4–9.vii.1975, G.B. Monteith and D.L. Hancock, (2♀♀); same locality, 9–13.vii.1975, G.B. Monteith, (1♂); Lake Boronto (=Wincheura), Newcastle Bay, CYP, 30.i.–4.ii.1975, G.B. Monteith, (1♂, 1♀); 6 km N of McDonnell R, CYP, 13–14.vii.1975, G.B. Monteith, (9♂♂, 2♀♀); Telegraph X'ing, Dulhunty R, CYP, 2–4.vii.1975, G.B. Monteith, (1♀); Moreton Telegraph Stn, CYP, 30.vi.1975, G.B. Monteith, (4♂♂, 2♀♀); Weipa, 5–8.ii.1975, G.B. Monteith, (2♂♂, 1♀); Evans

Landing, Weipa, 3–5.ii.1976, G.B. Monteith, (1♀); Hibberd Point, Weipa, 3–5.ii.1976, G.B. Monteith, (1♀); Iron Range, CYP, 30.vi.–4.vii.1977, G.B. Monteith, (2♀♀); Archer X'ing, 70 km N of Coen, CYP, 17–18.vii.1975, G.B. Monteith, (1♂); 18 km W of Port Stewart, 25–28.vi.1976, G.B. and S.R. Monteith, (2♂♂, 12♀♀); Cape Flattery Heath, 45 km N of Cooktown, 13–14.vii.1976, G.B. and S.R. Monteith, (6♂♂, 5♀♀); same locality, 20.x.1981, R.I. Storey and I.J. Titmarsh, (1♂); 10 km N of Hopevale, 9.vii.1976, G.B. and S.R. Monteith, (1♂); 15.10°S 145.07°E, 3.5 km SW by S of Mt Baird, 3–5.v.1981, A. Calder, (1♂); same data, I.D. Nauman, (1♀); 15.16°S 144.59°E, 14 km W by N of Hopevale Mission, 7–10.v.1981, J. Feehan, (1♀); 15.17°S 145.13°E, 1 km N of Rounded Hill, 5–6.x.1980, T. Weir, (1♂, 1♀); Wrotham Park, via Chillagoe, 26.xi.1977, R.I. Storey, (1♂); Maitland Downs, via Mt Carbine, 13–16.i.1978, R.I. Storey, (4♂♂, 14♀♀); 11 km WSW of Petford, 3–4.iv.1988, R.I. Storey, (2♂♂); Norman R via Normanton, 19.xi.1978, R.I. Storey, (2♂♂); Walker Ck, 40 km SE of Karumba, 28.v.1972, G.B. and S.R. Monteith, (1♀); 36 km W of Georgetown, 31.iii.1976, R.I. Storey, (2♂♂); 27 km W of Forsayth, 24.xii.1977, R.I. Storey, (3♂♂, 3♀♀); same data, 20–21.xi.1976, (1♂); 18.12°S 142.52°E, Gilbert R, 72 km W by N of Georgetown, 30.xi.1981, J. Balderson, (1♀); 12 km W of Herberton, 11–15.ii.1979, R.I. Storey, (2♀♀); 27–32 km W of Atherton, 15.ii.1975, H. and A. Howden, (1♀); 23 km E of Mareeba, 29.i.1989, R.I. Storey, (3♀♀); same locality, 11.ii.1989, H. and A. Howden, (1♀); Tolga, 6.i.1986, J.D. Brown, (1♂); same data, 23.i.1986, (1♂); 2–3 km up Mt Spec Rd, 7.v.1974, R.I. Storey, (1♀); Keppel Sands, 37 km E of Rockhampton, 6.iii.1975, H. and A. Howden, (1♂).NT: Larimah, 4.xii.1976, R.I. Storey, (2♂♂, 1♀); 14.31°S 132.22°E, Tindal, 1–20.xii.1967, W.J.M. Vestjens, (1♂); 12.28°S 131.03°E, Howard Springs, 24 km S of Darwin, 10.xi.1972, E. Britton, (1♂); 12.17°S 133.13°E, 18 km E by N of Oenpelli, 1.vi.1973, Matthews and Upton, (1♀); 11.09°S 132.09°E, Black Point, Coburg Pen, 15–23.ii.1977, T.A. Weir, (1♂, 1♀); 11.01°S 136.45°E, Rimbija Is, Wessel Is, 21.i.–3.ii.1977, Farrow and Downs, (1♂); same locality, 3–14.ii.1977, T.A. Weir, (1♂, 1♀).WA: Kununurra, 9–13.xii.1975, R.I. Storey,

(1♂, 1♀); 6 km E Kununurra, 12–13.xii.1975, R.I. Storey, (3♂♂, 1♀); Fitzroy River (on Hwy 1), 13.iv.1984, K. and E. Carnaby, (1♀); 14.48°S 129.49°E, 3 km NW by N of Mining Camp, Mitchell Flat, 15.v.1983, D. Rentz and J. Balderson, (1♂). Specimens in ANIC, HAHC, PGAC, QMBA, QPIM, SAMA, UQBA, WAMP.

COMMENTS

This widespread species is found throughout tropical Australia from the north of Western Australia across to the tip of Cape York Peninsula and as far south as Rockhampton in Queensland, often together with other species (*feehani*, *variolosum*, *intricatum*, *henryi* and *gestroi*). *T. novaehollandiae* is variable, although this variation does not seem (from the sample examined) to be geographical. The shape of the edge of the clypeus of the male varies considerably: the clypeal teeth can be short or long and the space between them varies from a broad U- to perfect V-shaped; the lateral excisions range from almost nonexistent to a prominent U- or V-shape. The eyes vary in width and in size of the gap with the canthus at the back of the head. There is some variation in the punctuation of the pronotum and elytral intervals, the punctures being at least twice as dense in some as in others. The protibial spur of the male also varies in shape, from long and truncate to shorter and wide, almost bifurcate, at the tip. However, judging from the shape of the aedeagus, only one species is involved. Specimens were taken at night in traps baited with human excrement and carrion and at light. One specimen was collected in a standing mushroom. Available records are from a variety of open forest types, on hard and sandy soils.

DISCUSSION

Although Australian species of *Tesserodon* are similar in general appearance, groupings, based on shape of the aedeagus, are recognised:

A – *pilicrepus*, *tenebroides*

B – *erratum*, *variolosum*

C – *intricatum*, *henryi*, *feehani*

D – *novaehollandiae*, *gestroi*, *granulatum*, *hil-leri*

The male of *simplicipunctatum* is unknown and *angulatum* from southwest Western Australia was not encountered in the study.

I suggest that group A is the most primitive through to group D being the most advanced. It is of interest that flightless species are known in groups A, C, and D. Thus it seems likely that wing reduction has arisen more than once, probably at least 3 times in the genus. Three of the new species from Queensland are flightless and have restricted distributions in relatively uninhabited areas. It is therefore probable that new species of the genus will be discovered through further collecting in northern areas.

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